Procedure: Hemoglobin Technique

Functional Area: VIII Certification, Eligibility & Coordination of Services

Section: B 1 e ii — Approval Date: 6/2015

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Purpose	To explain collection and handling of blood work sample for hemoglobin testing.
Training	All WIC CPA staff performing hematological testing must be trained on the manufacturer's instructions for the use of HemoCue® Hb 201+ Hemoglobin Analyzers.
Work Area	Select a work area for collection of the sample. An ideal work area: • Is clean • Ensures client and staff safety • Has a surface which is smooth and washable • Ensures patient privacy • Is away from noise and confusion • Has a chair and table
Assemble Supplies	• HemoCue® Hb 201+ analyzer • Gloves • Alcohol prep pads • Sterile retractable lancets of the appropriate size • Lint-free gauze pads • Closed vial of cuvettes • Bandages • Sharps container • Biohazard bag • 10% bleach solution or disinfectant • Soap and water or alcohol-based hand cleanser Place all blood collection supplies on a disinfected work area or clean paper towel.
Explain Procedure	Explain the procedure to the client or authorized representative in simple, understandable terms.
Cleanse/Glove Hands	Wash hands with soap and water or cleanse with an alcohol-based hand cleanser and put on gloves. • Gloves must be changed between every client

Cleanse/Glove Hands (cont.)

- Includes changing gloves between members of same family
- Gloves should not be washed or disinfected for continued use.
- Gloves should not be re-used.

Choose Puncture Site

Seat the participant or ask someone to help with a child. The caregiver may hold the child in his/her lap using both arms to keep the child still during the procedure.

Children & Women	• Extend the clients arm with the hand lower than the heart and palm facing up • Use a middle or ring finger that does not have a ring on it.

Infants	• For infants first certifying on the WIC Program from 9-12 months of age, referral data may be obtained, or obtaining the blood work may be delayed until the child is 12 months of age. • At 12 months of age and older, the finger is a recommended puncture site. • The toe is not an acceptable puncture site for infants or children.

Hold the Site

Grasp the finger firmly between your thumb and index finger with the palm facing up.

Cleanse the Site

Cleanse the site thoroughly with an alcohol pad, then wipe the site with a dry, clean gauze pad.

- Be sure the skin is dry. Alcohol remaining at the puncture site can result in a lower reading.

Prepare to Sample

Lightly press the finger from the closest knuckle to the tip in a rolling motion to stimulate the flow of blood to the sampling point.

- Do not touch the prepared site after cleaning.
- Do not "milk" the finger to speed the process. Squeezing or milking dilutes the blood and gives a false low reading.

*To increase blood circulation to the puncture site, have participant open and close hand or rub the hand, and make sure fingers are warm.

Puncture

Puncture the side of the finger pad nearest in on continuous motion, pressing firmly using the appropriate size retractable lancet. The finger should be facing upwards upon puncture.

Fill the Cuvette

Wipe away the first 3 drops of blood using a clean gauze pad. If necessary, press gently again with thumb and forefinger until another drop of blood appears. Avoid "milking".

1. Ensure that the drop of blood is big enough to fill the entire cuvette.
2. Holding the square end of the cuvette, touch the tip of the cuvette, pointing downward, into the middle of the drop of blood.
3. Fill the cuvette in one continuous draw, maintaining contact with the drop of blood. The cuvette will fill itself automatically. Do not "top off" the cuvette if it fills incompletely.
    - If the cuvette does not fill completely on the first try, discard the cuvette, wipe the puncture site and allow a new, larger bead of blood to form before collecting into a new cuvette.
4. Press a clean gauze pad on the puncture site to stop the blood flow. Ask the participant/caregiver to hold and apply pressure.
5. Wipe excess blood off the flat outside surfaces of the cuvette, on a dry gauze pad, keeping it at a 45° angle. Be careful not to touch the open-ended tip so that blood is not pulled back out of the cuvette. DO NOT use a cotton ball for this purpose.
6. Inspect the cuvette for air bubbles. Air bubbles should not be present in the center of the cuvette. The cuvette should be completely full of blood.

Measuring Hemoglobin Value

Place the cuvette into the holder of the analyzer and gently push the holder into the analyzer. When closed, the analyzer will automatically start the measuring process and the result will appear on the display.

Factors Responsible for Poor Results

Several factors may influence the hemoglobin results.

Poor collection technique, such as:

- Excess squeezing of finger. This dilutes the blood sample.
- Not thoroughly drying the site after wiping with alcohol pad.
- Failure to wipe off the first 3 drops of blood.
- "Topping off" the cuvette with additional blood, resulting in air bubbles or layers in the cuvette.
- Not filling the cuvette entirely
- Leaving the filled cuvette out of the HemoCue analyzer more than 10 minutes before measuring.

Mechanical problems such as:

- Malfunctioning equipment
- HemoCue analyzer not clean
- Cuvettes past expiration date or left exposed to air

Disposal of Supplies

All used lancets and used cuvettes should be put into a puncture resistant, contaminated materials (sharps) container immediately after use.

Disposal of Supplies (cont.)

- The sharps containers must be placed out of the reach of children at all times, and be placed near the area where procedures are performed. Dispose of sharps containers according to your local environmental health regulations.
- Alcohol preps, gauze, lint-free tissues, gloves, bandages and wrappers can be discarded in a regular trash bag if there are no means for biohazard waste disposal. It should be disposed of in a biohazard bag if possible.

Storage of Cuvettes

Proper storage of cuvettes is necessary to ensure accurate hemoglobin analysis. The cuvettes are very sensitive to humidity and moisture.

- Remove one cuvette at a time for testing.
- Store cuvettes at room temperature. Do not expose to any direct heat source or for prolonged periods at high temperature.
- Label the vial with the date on which it is opened.
- Label the vial with the date on which the contents of the vial expire – 90 days after opening. An unopened vial of cuvettes has a two-year shelf life from the date of manufacture.
- Snap the vial cap closed each time a cuvette is removed. Never leave the cap partially open.

Equipment

The Nebraska WIC program uses HemoCue® HB 201+ Hemoglobin Analyzers.

- The analyzer measures the amount of hemoglobin contained in a blood sample. The measurement takes up to 60 seconds and is expressed as g/dl.

Equipment Maintenance

The cuvette holder should be removed and cleaned after each day of use.

- Check that the analyzer is turned off. The display should be blank.
- Pull the cuvette holder out to its loading position. Carefully press the small catch positioned in the upper right corner of the cuvette holder.
- While pressing the catch, carefully rotate the cuvette holder towards the left as far as possible. Carefully pull the cuvette holder away from the analyzer.
- Clean the cuvette holder with alcohol or mild soap solution
- It is important that the cuvette holder is completely dry before being replaced in the photometer.

Local agencies shall assure accuracy of analyzers by following the manufacturer's directions for usage, additional troubleshooting, cleaning, and maintenance guidelines.

A written log should be maintained for all equipment used to complete biochemical assessments that documents when (date) the equipment was calibrated and cleaned and by whom.